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THE HALLUCINOGENIC FUNGI OF MEXICO: AN INQUIRY INTO THE ORIGINS OF THE RELIGIOUS IDEA AMONG PRIMITIVE PEOPLES*

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WHEN I received in Mexico your President's invitation to speak here today, I knew that your Committee had made an unorthodox choice, for I am not a professional mycologist. As the appointed hour approached my trepidation kept mounting, for I saw myself an amateur about to be thrown to a pack of professionals. But your President's gracious introductory remarks, however unmerited, have put me at my ease and lead me to hope that we shall all enjoy together a mushroom foray of a rather unusual nature.

Those of you who do not know the story will be interested in learning how it came about that my wife, who was a pediatrician, and I, who am a banker, took up the study of mushrooms. She was a Great Russian and, like all of her fellow-countrymen, learned at her mother's knee a solid body of empirical knowledge about the common species and a love of them that are astonishing to us Americans. Like us, the Russians are fond of nature—

* The *Annual Lecture* of the Mycological Society of America, Stillwater, Oklahoma. August 30, 1960. Revised.

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the forests and birds and wild flowers. But their love of mushrooms is of a different order, a visceral urge, a passion that passeth understanding. The worthless kinds, the poisonous mushrooms—the Russians are fond, in a way, even of them. They call these ‘worthless ones’ *paganki*, the ‘little pagans,’ and my wife would make of them colorful center-pieces for the dining-room table, against a background of moss and stones and wood picked up in the woods. On the other hand, I, of Anglo-Saxon origin, had known nothing of mushrooms. By inheritance, I ignored them all; I rejected those repugnant fungal growths, expressions of parasitism and decay. Before my marriage, I had not once fixed my gaze on a mushroom; not once looked at a mushroom with a discriminating eye. Indeed, each of us, she and I, regarded the other as abnormal, or rather subnormal, in our contrasting responses to mushrooms.

A little thing, some of you will say, this difference in emotional attitude toward wild mushrooms. Yet my wife and I did not think so, and we devoted a part of our leisure hours for more than thirty years to dissecting it, defining it, and tracing it to its origin. Such discoveries as we have made, including the rediscovery of the religious rôle of the hallucinogenic mushrooms of Mexico, can be laid to our preoccupation with that cultural rift between my wife and me, between our respective peoples, between the mycophilia and mycophobia (words that we devised for the two attitudes) that divide the Indo-European peoples into two camps. If this hypothesis of ours be wrong, then it must have been a singular false hypothesis to have produced the results that it has. But I think it is not wrong. Thanks to the immense strides made in the study of the human psyche in this century, we are now all aware that deep-seated emotional attitudes acquired in early life are of profound importance. I suggest

that when such traits betoken the attitudes of whole tribes or peoples, and when those traits have remained unaltered throughout recorded history, and especially when they differ from one people to another neighboring people, then you are face to face with a phenomenon of profound cultural importance, whose primal cause is to be discovered only in the well-springs of cultural history.

Many have observed the difference in attitude toward mushrooms of the European peoples. Some mycologists in the English-speaking world have inveighed against this universal prejudice of our race, hoping thereby to weaken its grip. What a vain hope! One does not treat a constitutional disorder by applying a band-aid. We ourselves have had no desire to change the Anglo-Saxon's attitude toward mushrooms. We view this anthropological trait with amused detachment, confident that it will long remain unchanged for future students to examine at their leisure.

Our method of approach was to look everywhere for references to mushrooms. We gathered the words for 'mushroom' and the various species in every accessible language. We studied their etymologies. Sometimes we rejected the accepted derivations and worked out new ones, as in the case of 'mushroom' itself and also of 'chanterelle.' We were quick to discern the latent metaphors in such words, metaphors that had lain dead in some cases for thousands of years. We searched for the meaning of those figures of speech. We sought for mushrooms in the proverbs of Europe, in myths and mythology, in legends and fairy tales, in epics and ballads, in historical episodes, in the obscene and scabrous vocabularies that usually escape the lexicographer; in the writings of poets and novelists. We were alert to the positive or negative value that the mushroom vocabularies carried, their mycophilic and mycophobic content. Mushrooms are widely

linked with the fly, the toad, the cock, and the thunderbolt; and so we studied these to see what associations they conveyed to our remote forebears. Wherever we traveled we tried to enter into contact with untutored peasants and arrive at their knowledge of the fungi—the kinds of mushrooms that they distinguished, their names, the uses to which they put them, and their emotional attitude toward them. We made trips to the Basque country, to Lapland, to Friesland, to the Provence, to Japan. We scoured the picture galleries and museums of the world for mushrooms and we pored over books on archeology and anthropology.

I would not have you think that we ventured into all these learned paths without guidance. We drew heavily on our betters in the special fields that we were exploring. When we were delving into questions of vocabulary, when we worked out an original etymology for a mushroomic word, we were always within reach of a philologist who had made of that tongue his province. And so in all branches of knowledge. Sometimes it seems to me that our entire work has been composed by others, with us merely serving as rapporteur. Since we began to publish in 1956, persons in all walks of life have come to us in increasing numbers to contribute information, and oftentimes the contributions of even the lowliest informants are of highest value, filling a lacuna in our argument. We were amateurs unencumbered by academic inhibitions, and therefore we felt free to range far and wide, disregarding the frontiers that ordinarily segregate the learned disciplines. What we produced was a pioneering work. We know, we have always known better than the critics, the flaws in ours, but our main theme, which we adumbrated rather diffidently in *Mushrooms Russia and History* in 1957, seems to have stood up under criticism. If I live and retain my vitality, you may see published over the

coming years a series of volumes, to be called perhaps *Ethnomycological Papers*, and, at the end of the road, there may be a new edition of our original work, reshaped, simplified, with new evidence added and the argument strengthened.

It would give me pleasure to enumerate the names of those to whom we are indebted, but how tedious the roll call would be for you who are obliged to listen! There is one name, however, that in this audience I must cite. For more than ten years, we have been collaborating closely with Professor Roger Heim, Membre de l'Institut, and on all matters mycological he has been our guide and teacher. For these many years, he has been the director in Paris of the Laboratoire de Cryptogamie and, even longer, editor of the *Revue de Mycologie*. More recently, he has also borne the burden of directing the Muséum National d'Histoire Naturelle, that renowned center for advanced teaching and research in the biological studies, one of the glories of French culture. But these titles to academic distinction, though themselves of the highest order, do not tell you the story. Vast as is his learning and his experience in field and laboratory, sound as is his judgment in the vexed problems that you mycologists face every day, formidable as he is in polemic, it is as a rare human being that I commend him to you. Patient with the beginner, inspiring as a teacher, model of generosity toward others, prodigious worker in field and laboratory, and classical stylist in the French language, who could be more delightful whether in his published writings, or as correspondent, or as companion in the field? In the presence of Roger Heim, the time-worn conflict between science and the humanities fades away. One senses that the field of science for him is merely the New World that civilized man, the exponent of the humanities, is exploring and assimilating. What guardian

angel had me in his keeping when, after the Second World War, I ascended the steps of his laboratory in Paris to meet him for the first time, a stranger, an American, an ignoramus in the complex, the vast, the exacting discipline that you and he share together? At once he made me feel at home and it was not long before he was developing enthusiasm for our ethnomycological inquiries. Later he became our indispensable and beloved partner in our Middle American forays.

I do not recall which of us, my wife or I, first dared to put into words, back in the '40's, the surmise that our own remote ancestors, perhaps 4,000 years ago, worshipped a divine mushroom. It seemed to us that this might explain the phenomenon of mycophilia vs. mycophobia, for which we found an abundance of supporting evidence in philology and folklore. Nor am I sure whether our conjecture was before or after we had learned of the rôle of *Amanita muscaria* in the religion of several remote tribes of Siberia. Our bold surmise seems less bold now than it did then. I remember distinctly how it came about that we embarked on our Middle American explorations. In the fall of 1952 we learned that the 16th century writers, describing the Indian cultures of Mexico, had recorded that certain mushrooms played a divinatory rôle in the religion of the natives. Simultaneously we learned that certain pre-Columbian stone artifacts resembling mushrooms, most of them roughly a foot high, had been turning up, usually in the highlands of Guatemala, in increasing numbers. For want of a better name, the archeologists called them 'mushroom stones,' but not one archeologist had linked them with mushrooms or with the rites described by the 16th century writers in neighboring Mexico. They were an enigma, and 'mushroom stone' was merely a term of convenience. Some of these stone carvings carried an effigy on the stipe, either

a human face or an animal, and all of them were very like mushrooms. Like the child in the Emperor's New Clothes, we spoke up, declaring that the so-called 'mushroom stones' really represented mushrooms, and that they were the symbol of a religion, like the Cross in the Christian religion, or the Star of Judea, or the Crescent of the Moslems. If we are right—and little by little the accumulating evidence seems to be in our favor—then this Middle American cult of a divine mushroom, this cult of 'God's flesh' as the Indians in pre-Columbian times called it, can be traced back to about B.C. 1500, in what we call the Early Pre-classic period, the earliest period in which man was in sufficient command of his technique to be able to carve stone. Thus we find a mushroom in the center of the cult with perhaps the oldest continuous history in the world. These oldest mushroom stones are technically and stylistically among the finest that we have, evidence of a flourishing rite at the time they were made. Earlier still, it is tempting to imagine countless generations of wooden effigies, mushroomic symbols of the cult, that have long since turned to dust. Is not mycology, which someone has called the step-child of the sciences, acquiring a wholly new and unexpected dimension? Religion has always been at the core of man's highest faculties and cultural achievements, and therefore I ask you now to contemplate our lowly mushroom—what patents of ancient lineage and nobility are coming its way!

It remained for us to find out what kinds of mushrooms had been worshipped in Middle America, and why. Fortunately, we could build on the experience of a few predecessors in the field: Blas Pablo Reko, Robert J. Weitlaner, Jean Bassett Johnson, Richard Evans Schultes, and Eunice V. Pike. They all reported that the cult still existed in the Sierra Mazateca in Oaxaca.

And so we went there, in 1953. In books and articles we have described time and time again our later adventures, and some of you, surely, are familiar with them. So far as we know, we were the first outsiders to eat the mushrooms, the first to be invited to partake in the agapé of the sacred mushroom.* I propose here this evening a new approach, and will give you the distinctive traits of this cult of a divine mushroom, which we have found a revelation, in the true meaning of that abused word, but which for the Indians is an every-day feature, albeit a Holy Mystery, of their lives.

Here let me say a word parenthetically about the nature of the psychic disturbance that the eating of the mushroom causes. This disturbance is wholly different from the effects of alcohol, as different as night from day. We are entering upon a discussion where the vocabulary of the English language, of any European language, is seriously deficient. There are no apt words in them to characterize your state when you are, shall we say, 'bemushroomed.' For hundreds, even thousands, of years we have thought about these things in terms of alcohol, and we now have to break the bonds imposed on us by the alcoholic association. We are all, willy nilly, confined within the prison walls of our every-day vocabulary. With skill in our choice of words we may stretch accepted meanings to cover slightly new feelings and thoughts, but when a state of mind is utterly distinct, wholly novel, then all our old words fail. How do you tell a man born blind what seeing is like? In the present case, this is especially true because superficially the bemushroomed man shows a few of the objective symptoms of one intoxicated, drunk. Now virtually all the words describing the state of drunkenness, from 'intoxicated' (which, as you know, means 'poisoned') through the scores of

* This was on the night of June 29-30, 1955.

current vulgarisms, are contemptuous, belittling, pejorative. How curious it is that modern civilized man finds surcease from care in a drug for which he seems to have no respect! If we use by analogy the terms suitable for alcohol, we prejudice the mushroom, and since there are few among us who have been bemushroomed, there is danger that the experience will not be fairly judged. What we need is a vocabulary to describe all the modalities of a Divine Inebriant.

These difficulties in communicating have played their part in certain amusing situations. Two psychiatrists who have taken the mushroom and known the experience in its full dimensions have been criticised in professional circles as being no longer 'objective.' Thus it comes about that we are all divided into two classes: those who have taken the mushroom and are disqualified by our subjective experience, and those who have not taken the mushroom and are disqualified by their total ignorance of the subject! As for me, a simple layman, I am profoundly grateful to my Indian friends for having initiated me into the tremendous Mystery of the mushroom. In describing what happens, I shall be using familiar phrases that may seem to give you some idea of the bemushroomed state. Let me hasten to warn you that I am painfully aware of the inadequacy of my words, any words, to conjure up for you an image of that state.

I shall take you now to the monolingual villages in the uplands of southern Mexico. Only a handful of the inhabitants have learned Spanish. The men are appallingly given to the abuse of alcohol, but in their minds the mushrooms are utterly different, not in degree, but in kind. Of alcohol they speak with the same jocular vulgarity that we do. But about mushrooms they prefer not to speak at all, at least when they are in company and especially when strangers, white strangers, are present.

If you are wise, you will talk about something, anything, else. Then, when evening and darkness come and you are alone with a wise old man or woman whose confidence you have won, by the light of a candle held in the hand and talking in a whisper, you may bring up the subject. Now you will learn how the mushrooms are gathered, perhaps before sunrise, when the mountain side is caressed by the pre-dawn breeze, at the time of the New Moon, in certain regions only by a virgin. The mushrooms are wrapped in a leaf, perhaps a banana leaf, sheltered thus from irreverent eyes, and in some villages they are taken first to the church, where they remain for some time on the altar, in a *jícara* or gourd bowl. They are never exposed in the market-place but pass from hand to hand by prearrangement. I could talk to you a long time about the words used to designate these sacred mushrooms in the languages of the various peoples that know them. The Aztecs before the Spaniards arrived called them *teo-nanácatl*, God's flesh. I need hardly remind you of a disquieting parallel, the designation of the Elements in our Eucharist: 'Take, eat, this is my Body. . . .'; and again, 'Grant us therefore, gracious Lord, so to eat the flesh of thy dear son. . . .' But there is one difference. The orthodox Christian must accept by faith the miracle of the conversion of the bread into God's flesh: that is what is meant by the Doctrine of Transubstantiation. By contrast, the mushroom of the Aztecs carries its own conviction; every communicant will testify to the miracle that he has experienced. In the language of the Mazatecs, the sacred mushrooms are called 'nti¹ ší³tho³. The first word, 'nti¹, is a particle expressing reverence and endearment.* The second element means 'that which springs forth.' In 1953 our muleteer

* The superscript digits indicate the pitch of the syllable, ¹ being the highest of four. The initial apostrophe indicates a glottal stop.

had travelled the mountain trails all his life and knew Spanish, though he could neither read nor write, nor even tell time by a clock's face. We asked him why the mushrooms were called 'that which springs forth.' His answer, breathtaking in its sincerity and feeling, was filled with the poetry of religion, and I quote it word for word as he gave it:

El honguillo viene por sí mismo, no se sabe de dónde,
como el viento que viene sin saber de dónde ni porqué.

The little mushroom comes of itself, no one knows whence,
like the wind that comes we know not whence nor why.

When we first went down to Mexico, we felt certain, my wife and I, that we were on the trail of an ancient and holy mystery, and we went as pilgrims seeking the Grail. To this attitude of ours I attribute such success as we have had. It has not been easy. For four and a half centuries the rulers of Mexico, men of Spanish blood or at least of Spanish culture, have never entered sympathetically into the ways of the Indians, and the Church regarded the sacred mushroom as an idolatry. The Protestant missionaries of today are naturally intent on teaching the Gospel, not on absorbing the religion of the Indians. Nor are most anthropologists good at this sort of thing... For more than four centuries the Indians have kept the divine mushroom close to their hearts, sheltered from desecration by white men, a precious secret. We know that today there are many *curanderos* who carry on the cult, each according to his lights, some of them consummate artists, performing the ancient liturgy in remote huts before minuscule congregations. With the passing years they will die off, and, as the country opens up, the cult is destined to disappear. They are hard to reach, these *curanderos*. Almost invariably they speak no Spanish. To them, performing before strangers seems a profanation. They will refuse even to meet with you, much

less discuss the beliefs that go with the mushrooms and perform for you. Do not think that it is a question of money: *no hicimos esto por dinero*, 'We did not this for money,' said Guadalupe, after we had spent the night with her family and the *curandera* María Sabina. Perhaps you will learn the names of a number of renowned *curanderos*, and your emissaries will even promise to deliver them to you, but then you wait and wait and they never come. You will brush past them in the market-place, and they will know you, but you will not know them. The judge in the town-hall may be the very man you are seeking; and you may pass the time of day with him, yet never learn that he is your *curandero*.

After all, would you have it any different? What priest of the Catholic Church will perform Mass to satisfy an unbeliever's curiosity? The *curandero* who today, for a big fee, will perform the mushroom rite for any stranger is a prostitute and a faker, and his insincere performance has the validity of a rite put on by an unfrocked priest. In the modern world religion is often an etiolated thing, a social activity with mild ethical rules. Religion in primitive society was an awesome reality, 'terrible' in the original meaning of that abused word, pervading all life and culminating in ceremonies that were forbidden to the profane. This is what the mushroom ceremony is in the remote parts of Mexico.

We often think of the mysteries of antiquity as a manifestation of primitive religion. Let me now draw your attention to certain parallels between our Mexican rite and the Mystery performed at Eleusis. The timing seems significant. In the Mazatec country the preferred season for 'consulting the mushroom' is during the rains, when the mushrooms grow, from June through August. The Eleusinian Mystery was celebrated in September or early October, the season of the mushrooms in the Mediter-

anean basin. At the heart of the Mystery of Eleusis lay a secret. In the surviving texts there are numerous references to the secret, but in none is it revealed. Yet Mysteries such as this one at Eleusis played a major rôle in Greek civilization, and thousands must have possessed the key. From the writings of the Greeks, from a fresco in Pompeii, we know that the initiate drank a potion. Then, in the depths of the night, he beheld a great vision, and the next day he was still so awestruck that he felt he would never be the same man as before. What the initiate experienced was 'new, astonishing, inaccessible to rational cognition.'* One writer in the 2nd century A.D., by name Aristides, pulled the curtain aside for an instant, with this fragmentary description of the Eleusinian Mystery:

Eleusis is a shrine common to the whole earth, and of all the divine things that exist among men, it is both the most awesome and the most luminous. At what place in the world have more miraculous tidings been sung, where have the dromena called forth greater emotion, *where has there been greater rivalry between seeing and hearing?*

And then he went on to speak of the 'ineffable visions' that it had been the privilege of many generations of fortunate men and women to behold.

Just dwell for a moment on that description. How striking that the Mystery of antiquity and our mushroom rite in Mexico are accompanied in the two societies by veils of reticence that, so far as we can tell, match each other point for point! Our ancient writers' words are as applicable to contemporary Mexico as they were to classic Greece! May it not be significant that the Greeks were wont to refer to mushrooms as 'the food of the gods,' *brōma theon*, and that Porphyrius is quoted as having

* For this and the following quotations see Walter F. Otto: *The Meaning of the Eleusinian Mysteries*, published in *The Mysteries*, 1955, ed. by Joseph Campbell, Pantheon Books, Bollingen Series XXX, 2; pp. 20 et seq. Italics are mine.

called them 'nurslings of the gods,' *theotróphos**? The Greeks of the classic period were mycophobes. Was this because their ancestors had felt that the whole fungal tribe was infected 'by attraction' with the holiness of some mushrooms and that they were not for mortal men to eat, at least not every day? Are we dealing with what was in origin a religious tabu?

In earliest times the Greeks confined the common European word for mushroom, which in their language was *sp(h)óngos* or *sp(h)óngê*, to the meaning 'sponge,' and replaced it by a special word, *múkês*, for the designation of mushrooms.† Now it happens that the root of this word *múkês* in Greek is a homonym of the root of the Greek word for 'Mystery,' *mu*. A bold speculation flashes through the mind. The word for 'Mystery' comes from a root that means the closing of the apertures of the body, the closing of the eyes and ears. If the mushroom played a vital and secret rôle in primitive Greek religion, what could be more natural than that the standard word for 'mushroom' would fall into disuse through a religious tabu (as in Hebrew 'Yahweh' gave way to 'Adonai') and

* Giambattista della Porta: *Villa*, 1592, Frankfort, p. 764.

† Holger Pedersen in an early paper contended that the basic fungal words of Europe were identical: Old High German *swamb*, Slavic *gomba*, Lithuanian *gumbas*, Latin *fungus*, Greek *sp(h)óngos*, *sp(h)óngê*, and Armenian *sung*, *sunk*. (Published in Polish: 'Przyczynki do gramatyki porównawczej języków słowiańskich,' in *Materyaly i Prace Komisji Językowej Akademii Umiejetnosci w Krakowie*, Cracow, 1(1): 167-176.) Since then some philologists have declined to accept this thesis as more than a possibility, especially as to the Slavic term, but Professor Roman Jakobsan in a recent personal communication to me says: 'The etymology of Holger Pedersen, the great Danish specialist in the comparative study of Indo-European languages, seems to me and to many other linguists, e.g., the distinguished Czech etymologist V. Machek, as the only convincing attempt to interpret the fungal name of the European languages. Not one single serious argument has been brought against Pedersen's "attractive" explanation, as Berneker defines it, and not one single defensible hypothesis has been brought to replace this one.'

that the Greeks substituted an alternative fungal term that was a homonym of 'mystery'? You can hear the pun, see the gesture, 'Mum's the word,' with the index finger over the mouth. . . . We must remember, in considering this problem, that in antiquity the ecology of Greece and the Greek isles was different from now. Deforestation and the goats had not wrought the havoc of the intervening centuries. They had not left the mountains naked to the sun. On the wooded isles and in the forests of the mainland, there must have been a wealth of mushrooms.

Let us consider possibilities other than the mushroom. In the Mazatec country the Indians, when there are no mushrooms, have recourse to alternatives. Thanks to the brilliant work of Dr. Albert Hofmann of Sandoz, the Swiss pharmaceutical firm, we are now sorting out and identifying a whole series of indoles that have remarkable psychotropic properties. As you all know, he has isolated the active agents in some of our Mexican mushrooms, psilocybin and psilocin, two tryptamine derivatives and members of the indole family of substances. He has defined their molecular structure. The magic indoles are present in other plants used widely among the Indians of Mexico. With Dr. Hofmann's permission, I am able to announce to you tonight that, only in July of this year, he has isolated and identified three of the active agents in *ololiuqui*, the famous seeds, subject of many studies, that have long been used in Mexico for their psychotropic properties.* In the Mazatec country the seeds of *ololiuqui* are one of the alternatives used when the sacred mushrooms are not available. Imagine our surprise, when we began looking for these seeds in quantity last year, to discover that the Zapotec Indians, em-

* The Chemistry of Natural Products, paper read by Dr. Hofmann, Aug. 18, 1960, in the I.U.P.A.C. Symposium, Melbourne.

ploy two seeds: in some villages one, in others the other, and in some both. There is no question which seed was the *ololiuqui* of the Aztecs. It is a climbing morning-glory known to science as *Rivea corymbosa* (L.) Hallier filius.* The seeds are brown and almost round. The second plant was identified at the National Herbarium in Washington as *Ipomoea violacea* L.,† also a climbing morning-glory but easily distinguished in the field from *Rivea corymbosa*. The seeds are long, black, and angular, and so far as we now know, they are used only in some parts of the Zapotec country. Both are called in Zapotec *badoh*, but the black seeds are *badoh negro*, black *badoh*, to distinguish them from the true *ololiuqui* seeds.°

* The best summary of the *ololiuqui* literature and problem is Richard Evans Schultes' A Contribution to Our Knowledge of *Rivea corymbosa*, the Narcotic Ololiuqui of the Aztecs, Botanical Museum, Harvard University, 1941. Also see Humphrey Osmond's Ololiuqui: The Ancient Aztec Narcotic, *Journal of Mental Science*, July 1955, 101 (424): 526-537. Dr. Osmond reports on the effects of the seeds on himself.

‡ ***Ipomoea violacea* Linnaeus** Pl. Sp. (1953) 161.

Convolvulus indicus Miller Gard. Dict. (1768) No. 5.

Ipomoea tricolor Cavanilles Icon. Pl. Rar. 3 (1794) 5.

Convolvulus violaceus Sprengel Syst. 1 (1825) 399.

Convolvulus venustus Sprengel Syst. 1 (1825) 399.

Ipomoea rubrocoerulea Hooker Bot. Mag. (1834) t. 3297.

Pharbitis violacea (L.) Bojer Hort. Maurit. (1837) 227.

Tereietra violacea (L.) Rafinesque Fl. Tellur. 4 (1839) 124.

Ipomoea Hookeri G. Don Gen. Syst. 4 (1838) 274.

Pharbitis rubrocoeruleus (Hook.) Planchon Fl. des Serres 9 (1854) 281.

Convolvulus rubrocoeruleus (Hook.) D. Dietrich Syn. Pl. 1 (1839) 670.

Ipomoea puncticulata Benthham Bot. Voy. Sulph. (1945) 136.

° Credit for the discovery of the ceremonial use of *Ipomoea violacea* seeds goes to Thomas MacDougall and Francisco Ortega ('Chico'), famous Zapotec guide and itinerant trader. They have not yet delimited the area of diffusion, but they have found *badoh negro* seeds in use in the following Zapotec towns and villages in the uplands of southern Oaxaca: San Bartolo Yautepec, San Carlos Yautepec and Santa Catarina Quieri, all in the district of Yautepec; Santa Cruz

Dr. Hofmann found that the alkaloidal components of the two seeds were identical, and they yielded d-lysergic acid amide and d-isolysergic acid amide, in the LSD 25 family of substances and known heretofore only as derivatives of ergot. Is it not surprising to find in higher plants such as the Convolvulaceae the same lysergic acid derivatives as in the lower fungi? The third substance found in these seeds was *chanoclavine*, also isolated by Dr. Hofmann et al. some years ago from a culture of *Claviceps* species.*

Thus it comes about that, thanks to the achievements of our biological chemists, we may be on the brink of rediscovering what was common knowledge among the ancient Greeks. I predict that the secret of the Mysteries will be found in the indoles, whether derived from mushrooms or from higher plants or, as in Mexico, from both.

I would not be understood as contending that only these substances (wherever found in nature) bring about visions and ecstasy. Clearly some poets and prophets and many mystics and ascetics seem to have enjoyed ecstatic visions that answer the requirements of the ancient Mysteries and that duplicate the mushroom agapé of Mexico. I do not suggest that St. John of Patmos ate mushrooms in order to write the Book of the Revelation. Yet the succession of images in his Vision, so clearly seen and yet

Ozolotepec and San Andrés Lovene, District of Miahuatlan; and finally a settlement called Roalo, between Zaachila and Zimatlan, just south of the city of Oaxaca. In San Bartolo *I. violacea* is used to the exclusion of *Rivea corymbosa*, but in the other towns both are used. These data are based on personal correspondence and also Thomas MacDougall: *Ipomoea tricolor*: A Hallucinogenic Plant of the Zapotecs, in *Boletín* of the Centro de Investigaciones Antropológicas de México, No. 6, March 1, 1960. Reports from Juquila, to the west of the Zapotec towns mentioned above, indicate that *I. violacea* seeds may also be used among the Chatino Indians.

* A. Hofmann with R. Brunner, H. Kobel, and A. Brack, *Helv. Chem. Acta*, 1957, 40:1358.

such a phantasmagoria, means for me that he was in the same state as one bemushroomed. Nor do I suggest for a moment that William Blake knew the mushroom when he wrote this telling account of the clarity of 'vision':

The Prophets describe what they saw in Vision as real and existing men, whom they saw with their imaginative and immortal organs; the Apostles the same; the clearer the organ the more distinct the object. A Spirit and a Vision are not, as the modern philosophy supposes, a cloudy vapour, or a nothing: they are organized and minutely articulated beyond all that the mortal and perishing nature can produce. *He who does not imagine in stronger and better lineaments, and in stronger and better light than his perishing eye can see, does not imagine at all.* [Italics mine. From *The Writings of William Blake*, ed. by Geoffrey Keynes, vol. III, p.108]

This must sound cryptic to one who does not share Blake's vision or who has not taken the mushroom. The advantage of the mushroom is that it puts many (if not everyone) within reach of this state without having to suffer the mortifications of Blake and St. John. It permits you to see, more clearly than our perishing mortal eye can see, vistas beyond the horizons of this life, to travel backwards and forwards in time, to enter other planes of existence, even (as the Indians say) to know God. It is hardly surprising that your emotions are profoundly affected, and you feel that an indissoluble bond unites you with the others who have shared with you in the sacred agapé. All that you see during this night has a pristine quality: the landscape, the edifices, the carvings, the animals—they look as though they had come straight from the Maker's workshop. This newness of everything—it is as though the world had just dawned—overwhelms you and melts you with its beauty. Not unnaturally, what is happening to you seems to you freighted with significance, beside which the humdrum events of everyday are trivial. All these things you see with an immediacy of vision that leads you to say to

yourself, 'Now I am seeing for the first time, seeing direct, without the intervention of mortal eyes.' (Plato tells us that beyond this ephemeral and imperfect existence here below, there is another Ideal world of Archetypes, where the original, the true, the beautiful Pattern of things exists for evermore. Poets and philosophers for millenniums have pondered and discussed his conception. It is clear to me where Plato found his Ideas; it was clear to his contemporaries too. Plato had drunk of the potion in the Temple of Eleusis and had spent the night seeing the great Vision.)

And all the time that you are seeing these things, the priestess sings, not loud, but with authority. The Indians are notoriously not given to displays of inner feelings—except on these occasions. The singing is good, but under the influence of the mushroom you think it is infinitely tender and sweet. It is as though you were hearing it with your mind's ear, purged of all dross. You are lying on a *petate* or mat; perhaps, if you have been wise, on an air mattress and in a sleeping bag. It is dark, for all lights have been extinguished save a few embers among the stones on the floor and the incense in a sherd. It is still, for the thatched hut is apt to be some distance away from the village. In the darkness and stillness, that voice hovers through the hut, coming now from beyond your feet, now at your very ear, now distant, now actually underneath you, with strange ventriloquistic effect. The mushrooms produce this illusion also. Everyone experiences it, just as do the tribesmen of Siberia who have eaten of *Amanita muscaria* and lie under the spell of their shamans, displaying as these do their astonishing dexterity with ventriloquistic drum-beats. Likewise, in Mexico, I have heard a shaman engage in a most complicated percussive beat: with her hands she hits her chest, her thighs, her forehead, her arms, each giving a

different resonance, keeping a complicated rhythm and modulating, even syncopating, the strokes. Your body lies in the darkness, heavy as lead, but your spirit seems to soar and leave the hut, and with the speed of thought to travel where it listeth, in time and space, accompanied by the shaman's singing and by the ejaculations of her percussive chant. What you are seeing and what you are hearing appear as one: the music assumes harmonious shapes, giving visual form to its harmonies, and what you are seeing takes on the modalities of music—the music of the spheres. 'Where has there been greater rivalry between seeing and hearing?' How apposite to the Mexican experience was the ancient Greek's rhetorical question! All your senses are similarly affected: the cigarette with which you occasionally break the tension of the night smells as no cigarette before had ever smelled; the glass of simple water is infinitely better than champagne. Elsewhere I once wrote that the bemushroomed person is poised in space, a disembodied eye, invisible, incorporeal, seeing but not seen. In truth, he is the five senses disembodied, all of them keyed to the height of sensitivity and awareness, all of them blending into one another most strangely, until the person, utterly passive, becomes a pure receptor, infinitely delicate, of sensations. (You, being a stranger, are perforce only a receptor. But the Mazatec communicants are also participants with the *curandera* in an extempore religious colloquy. Her utterances elicit spontaneous responses from them, responses that maintain a perfect harmony with her and with each other, building up to a quiet swaying antiphonal chant. In a successful ceremony this is an essential element, and one cannot experience the full effect of the rôle of the mushroom in the Indian community unless one attends such a gathering, either alone or with one or at most two other strangers.) As your body lies there in its sleep-

ing bag, your soul is free, loses all sense of time, alert as it never was before, living an eternity in a night, seeing infinity in a grain of sand. What you have seen and heard is cut as with a burin in your memory, never to be effaced. At last you know what the ineffable is, and what ecstasy means. Ecstasy! The mind harks back to the origin of that word. For the Greeks *ekstasis* meant the flight of the soul from the body. Can you find a better word than that to describe the bemushroomed state? In common parlance, among the many who have not experienced ecstasy, ecstasy is fun, and I am frequently asked why I do not reach for mushrooms every night. But ecstasy is not fun. Your very soul is seized and shaken until it tingles. After all, who will choose to feel undiluted awe, or to float through that door yonder into the Divine Presence? The unknowing vulgar abuse the word, and we must recapture its full and terrifying sense. . . . A few hours later, the next morning, you are fit to go to work. But how unimportant work seems to you, by comparison with the portentous happenings of that night! If you can, you prefer to stay close to the house, and, with those who lived through that night, compare notes, and utter ejaculations of amazement.

As man emerged from his brutish past, thousands of years ago, there was a stage in the evolution of his awareness when the discovery of a mushroom (or was it a higher plant?) with miraculous properties was a revelation to him, a veritable detonator to his soul, arousing in him sentiments of awe and reverence, and gentleness and love, to the highest pitch of which mankind is capable, all those sentiments and virtues that mankind has ever since regarded as the highest attribute of his kind. It made him see what this perishing mortal eye cannot see. How right the Greeks were to hedge about this Mystery, this imbibing of the potion, with secrecy and surveil-

lance! What today is resolved into a mere drug, a tryptamine or lysergic acid derivative, was for him a prodigious miracle, inspiring in him poetry and philosophy and religion. Perhaps with all our modern knowledge we do not need the divine mushrooms any more. Or do we need them more than ever? Some are shocked that the key even to religion might be reduced to a mere drug. On the other hand, the drug is as mysterious as it ever was: 'like the wind it cometh we know not whence, nor why.' Out of a mere drug comes the ineffable, comes ecstasy. It is not the only instance in the history of humankind where the lowly has given birth to the divine. Altering a sacred text, we would say that this paradox is a hard saying, yet one worthy of all men to be believed.

If our classical scholars were given the opportunity to attend the rite at Eleusis, to talk with the priestess, what would they not exchange for that chance? They would approach the precincts, enter the hallowed chamber, with the reverence born of the texts venerated by scholars for millenia. How propitious would their frame of mind be, if they were invited to partake of the potion! Well, those rites take place now, unbeknownst to the classical scholars, in scattered dwellings, humble, thatched, without windows, far from the beaten track, high in the mountains of Mexico, in the stillness of the night, broken only by the distant barking of a dog or the braying of an ass. Or, since we are in the rainy season, perhaps the Mystery is accompanied by torrential rains and punctuated by terrifying thunderbolts. Then, indeed, as you lie there bemushroomed, listening to the music and seeing the visions, you know a soul shattering experience, recalling as you do the belief of some primitive peoples that mushrooms, the sacred mushrooms, are divinely engendered by Jupiter Fulminans, the God of the Lightning-bolt, in the Soft Mother Earth.

APPENDIX

The following enumeration is the first list published in English of the hallucinogenic mushrooms of Mexico. With each name we give the place of publication of (1) the technical name of the mushroom and (2) the earliest report of its use in Mexico as a divinatory agent. Doubtless more species will be discovered, but we believe our list is complete through 1960.

Not all divinatory mushrooms are hallucinogenic. The Indians consume some kinds for divinatory purposes because of their suggestive shape. This is true of *Cordyceps capitata* (Holmsk.) Link, as well as its host fungi, *Elaphomyces granulatus* Fr. or *Elaphomyces variegatus* Vitt., and also of *Dictyophora phalloidea* Desvaux. *Cordyceps capitata* has been found to contain an indolic compound that might cause hallucinations, but only in trace amounts. There are also reports of the use of *Clavaria truncata* Qué. and *Nevrophyllum floccosum* (Schw.) Heim, but their hallucinogenic virtue remains doubtful, and they are always taken in conjunction with *Psilocybe Wassonii* Heim. (See Les champ. halluc. du Mexique, 1958, pp. 81, 83, 99, 162.) *Psilocybe muliercula* Singer & Smith has been reported as an hallucinogen (in Mycologia 50 (1958) 145), but this concept is a synonym of *Ps. Wassonii* (see below).

Professor Roger Heim and I accept responsibility for all species and varieties listed that are marked by an asterisk.

**Conocybe siligineoides* Heim in Rev. Mycol. 22 (1957) 197.

Use first reported: in Comptes Rend. 242 (1956) 1391.

Panaeolus fimicola (*Fr.*) *Quélet ex Fries* Hym. Europ. (1874) 312.

Use first reported: in Bol. Soc. Bot. Mex. No. 24 (1959) 23.

Panaeolus sphinctrinus (*Fr.*) *Quélet ex Fries* Epicr. syst. mycol. seu synops. Hymenomyc. (1836–38) 235.

Use first reported: in Bot. Mus. Leaflet. Harvard Univ. 7 (1939) 37 (as *P. campanulatus* L. var. *sphinctrinus* (*Fr.*) Bresadola).

Psathyrella sepulchralis *Singer, Smith & Guzmán* in Lloydia 21 (1958) 26.

Use first reported: loc. cit.

***Psilocybe acutissima** *Heim* in Rev. Mycol. 24 (1959) 106.

Use first reported: in Les champ. halluc. du Mexique (1958) 166.

***Psilocybe aztecorum** *Heim* in Rev. Mycol. 22 (1957) 78.

Use first reported: in Comptes Rend. 244 (1957) 699.

***Psilocybe caerulescens** *Murrill* var. **mazatecorum** *Heim* in Rev. Mycol. 22 (1957) 78.

Psilocybe mazatecorum *Heim* in Comptes Rend. 242 (1956) 1392, *nomen prov., sine diagn. lat.*

Use first reported: loc. cit.

***Psilocybe caerulescens** *Murrill* var. **mazatecorum** *Heim* fma. **heliophila** *Heim* in *Heim & Wasson* Les champs. halluc. du Mexique (1958) 141, *sine diagn. lat.*

Use first reported: loc. cit.

***Psilocybe caerulescens** *Murrill* var. **mazatecorum**
Heim. fma. **ombrophila** *Heim* in *Heim & Wasson*
Les champs. halluc. du Mexique (1958) 140, *sine*
diagn. lat.

Use first reported: loc. cit.

***Psilocybe caerulescens** *Murrill* var. **nigripes** *Heim*
in *Rev. Mycol.* 22 (1957) 79.

Use first reported: in *Comptes Rend.* 244 (1957) 698.

Psilocybe caerulipes (*Peck*) *Saccado* var. **Gastonii**
Singer & Smith in *Sydowia* 12 (1959) 236.

Use first reported: loc. cit.

Psilocybe candidipes *Singer & Smith* in *Mycologia*
50 (1958) 141.

Use first reported: loc. cit. 250.

***Psilocybe cordispora** *Heim* in *Rev. Mycol.* 24 (1959)
103.

Use first reported: in *Comptes Rend.* 242 (1956) 1390.

***Psilocybe fagicola** *Heim & Cailleux* in *Rev. Mycol.* 24
(1959) 438.

Use first reported: in *Comptes Rend.* 249 (1959) 1843.

***Psilocybe Hoogshagenii** *Heim* in *Rev. Mycol.* 24
(1959) 104.

Use first reported: in *Les champs. halluc. du Mexi-*
que (1958) 167.

Psilocybe isauri *Singer* in *Sydowia* 12 (1959) 237.

Use first reported: loc. cit.

***Psilocybe mexicana** *Heim* in *Rev. Mycol.* 22 (1957)
77.

Use first reported: in *Comptes Rend.* 242 (1956) 966.

***Psilocybe mixaeensis** *Heim* in Rev. Mycol. 24 (1959) 104.

Use first reported: in Les champs. halluc. du Mexique (1958) 169.

***Psilocybe semperviva** *Heim & Cailleux* in Rev. Mycol. 23 (1958) 352.

Use first reported: in Comptes Rend. 245 (1957) 1764.

***Psilocybe Wassonii** *Heim* in Rev. Mycol. 23 (1958) 119.

Psilocybe muliercula Singer & Smith in Mycologia 50 (1958) 142.

Use first reported: in Comptes Rend. 245 (1957) 1763.

***Psilocybe yungensis** *Singer & Smith* in Mycologia 50 (1958) 142.

Use first reported: in Bol. Soc. Mex. No. 24 (1959) 22.

***Psilocybe zapotecorum** *Heim* in Rev. Mycol. 22 (1957) 77.

Use first reported; in Comptes Rend. 242 (1956) 1393.

***Psilocybe zapotecorum** *Heim* var. **elongata** *Heim* in Comptes Rend. 250 (1960) 1158, *nomen prov., sine diagn. lat.*

***Stropharia cubensis** *Earle* Inf. An. Establ. Centr. Agron. Cub. 1 (1906) 240.

Psilocybe cubensis (Earle) Singer in Lilloa 22 (1949) 507.

Use first reported: in Comptes Rend. 242 (1956) 967.